Abstract

The polymer thermoelectric is an upcoming and rather new field in the thermoelectric community. Up to now polymers are not able to replace other materials like BiTe in the room temperature region. The main advantage of polymers is the flexible and non-toxic character of the material. Especially the opportunities to build flexible TEG, which can be wrapped around different surfaces like pipes, are attractive for industrial applications or body electronics. We are studying the thermoelectric behavior of polymers like PEDOT and polymer composites. The tuning of the Seebeck coefficient and the electric conductivity are currently our main focuses.

Parallel we are developing printing and design strategies for the polymer TEG. We use dispenser printing to build up the generator. The printed TEG are characterized and investigated. The power output of the thermoelectric device is at the moment in the range of ~100 nW/cm$^2$ (ΔT=80 K). We will present strategies for printing a flexible TEG by dispenser processes and also strategies for optimization the thermoelectric materials. Especially from the scientific point of view there are still open questions, which need to be solved. Like reducing the internal resistance (metal-polymer-contact), or creating an effective n-conducting polymer.